CE filter tap weights with the FFE and DFE filter tap coefficients converged upon by the SE circuit during reception of multiple bursts of training data, and loads these newly calculated tap weight coefficients into the FFE and DFE filters of CE circuit 764 in the RU receiver of Figure 30 via bus 844, as symbolized by step 1132 of Figure 53C.--.

At page 169, line 17, delete "1502" and subsitute --1501--.

At page 169, line 21, delete "1504" and subsitute --1507--.

At page 169, line 29, delete "1506" and subsitute --1509--.

At page 169, line 31, delete "1508" and subsitute --1511--.

At page 170, line 2, delete "1510" and subsitute --1513--.

At page 170, line 10, delete "1512" and subsitute --1515--.

At page 170, line 5, delete "1516" and subsitute --1517--.

At page 170, line 12, delete "1514" and subsitute --1519--.

At page 170, line 14, after "." and before "Then", insert --The main tap coefficient of the SE feed forward equalization filter is then set to one and the side tap coefficients of the SE feed forward and decision feedback equalization filters are set to zero for receipt of payload data.--

At page 187, delete the entire paragraph that extends from line 24 to line 27.

IN THE CLAIMS

Renumbered

Please cancel claims 1-83 from the parent spec and add the below claims:

84 ~~1~~. An remote transceiver for use in a system having a plurality of remote transceivers that transmit synchronous time division multiplexed frames of upstream data to a central transceiver on a shared medium on the same frequency, comprising:

a time division multiplexed receiver having any conventional clock and carrier recovery circuits, for recovering a master clock and master carrier

transmitted downstream and generating local clock and carrier signals that are synchronized with the recovered master clock and master carrier, and having conventional demodulator, demultiplexer and detector circuits to recover downstream payload data;

a conventional time division multiplexed transmitter coupled to receive upstream payload data and said local clock and local carrier signals and organize said payload data into timeslots and transmit said timeslots, but said transmitter having an improvement comprising any type ranging circuitry that cooperates with a central transceiver to determine a transmit frame timing delay which will cause frame synchronization to exist such that each frames transmitted by said remote transceiver arrives at said central transceiver timed so as to have its timeslot boundaries exactly lined up in time with the timeslot boundaries of frames transmitted by other remote transceivers that have already achieved frame synchronization.

85 ~~2~~. The apparatus of claim 84 ~~2~~ wherein said central transceiver sends downstream frames to each remote transceiver multiplexed in any way including no multiplexing and modulated in any way, and wherein said synchronous time division multiplexed transmitter generates frames of the same size as said downstream frames and said ranging circuitry is structured to establish said transmit frame timing delay such that frames transmitted by said remote unit modem have their frame boundaries aligned in time not only with the frame boundaries of other remote transceivers which have achieved frame synchronization but also correctly aligned in time with frame boundaries estabished by an upstream frame counter in said central transceiver.

86 ~~3.~~ The apparatus of claim ~~2~~ 85 further comprising a frequency converter coupled to said remote transceiver transmitter for converting the output frequency of said transmitter to a frequency that does not interfere with downstream transmissions from said central transceiver or with any other transmissions on said shared medium.

87 ~~4.~~ The apparatus of claim ~~1~~ 84 wherein said remote transmitter transmits upstream frames with a gap between each frame during which no upstream payload data is transmitted, and wherein said ranging circuitry comprises means for carrying out a ranging process before any upstream payload data is sent comprising an iterative trial and error adjustment of said transmit frame timing delay followed by transmission of a ranging signal with good correlation properties such that it can be found in the presence of noise and continuing this iterative process until a message is received from said central transceiver that said ranging signal has arrived in a gap, and then for transmitting identification information during an authentication interval that identifies this particular remote transceiver, and then for cooperating with said central transceiver to carry out a fine tuning process to adjust said transmit frame timing delay such that the frame and timeslot boundaries of frames and timeslots transmitted by said remote transceiver exactly line up in time at the input to said central transceiver with frames and timeslots transmitted by other remote transceivers that have achieved frame synchronization.

88 ~~5.~~ The apparatus of claim ~~1~~ 84 wherein said remote unit transmitter transmits upstream frames with a gap between each frame during which no upstream payload data

is transmitted, and wherein said ranging circuitry comprises a computer programmed to coordinate the implementation of a trial and error ranging process prior to transmission of any upstream data, said ranging process comprised of the steps of said computer setting an initial transmit frame timing delay value and transmitting that value to said time division multiplexed transmitter and said transmitter using said value to time the transmission of a ranging signal that can be found in the presence of noise, and then said computer iteratively changing the transmit frame timing delay value and causing said transmitter to transmit another ranging signal until one or more messages are received by said receiver from said central transceiver are received that said ranging signal has been received and by how much and in what direction to adjust said transmit frame timing delay value to achieve frame synchronization, said computer then setting said transmit frame timing delay value at said value which causes frame synchronization to exist and thereafter using said value for subsequent transmission of upstream frames of payload data.

89 ~~8~~. The apparatus of claim ~~1~~ 84 wherein said transmitter transmits data upstream to said central transceiver in frames separated by gaps, and wherein said computer is further programmed to transmit identification information to said central transceiver during an authentication interval after said receiver first receives a message a said ranging signal has been found in a gap by said central transceiver, said identification information comprising transmission of said ranging signal in a unique sequence that identifies said remote transceiver during an authentication interval comprised of a plurality of gaps, said unique sequence comprised of transmission of ranging signals during a predetermined number of said gaps that do not have to be contiguous and silence

during the remaining gaps of said authentication interval, and further programmed to determine if after sending said identification information said receiver receives a message directed to said remote transceiver indicating said central transceiver has received said identification information and knows who sent said ranging signal, and further programmed to monitor said receiver for reception of a fine tuning message from said central transceiver indicating by how much and in which direction to adjust said transmit frame timing delay to achieve frame synchronization.

90 ~~7~~. A synchronous multiplexed central transceiver for use in a digital data communication system comprised of said central transceiver coupled by a shared transmission medium to a plurality of remote transceivers, comprising:

a downstream transmitter means for using any multiplexing and any modulation technique to transmit data from different services downstream to said plurality of remote transceivers;

an upstream TDMA or SCDMA receiver means of any design for receiving time division multiplexed or code division multiplexed transmissions from all of said remote transceivers; and

ranging means for receiving ranging transmissions from said remote transceivers and sending messages to said remote transceivers that they can use to achieve frame synchronization such that each frame of code division multiplexed or time division multiplexed data transmitted from a remote transceiver that arrives at said receiver means arrives with its frame boundaries virtually exactly aligned in time with the frame boundaries of frames transmitted from other remote transceivers that have already achieved frame

synchronization.

91 ~~8~~. The apparatus of claim 90 ~~7~~ further comprising:

a master clock oscillator coupled to said transmitter means and said receiver means;

a master carrier oscillator coupled to said transmitter and and said receiver means; and

wherein said receiver means includes means for using said master clock and master carrier signals and preamble data received from each remote transceiver to receive upstream data therefrom.

92 ~~9~~. The apparatus of claim 90 ~~7~~ wherein said receiver means includes conventional clock and carrier recovery circuits to recover the chip clock or symbol clock and carrier signal used by each remote transceiver to transmit upstream preamble and payload data and for using said recovered clock and carrier signals to receive said upstream preamble and payload signals.

93 ~~10~~. A process of synchronous time division or code division multiplexed upstream transmissions of digital data to a headend transceiver on the same frequency over a shared transmission medium from a plurality of distributed remote transceivers all at different distances from a headend transceiver comprising the steps:

receiving at a remote transceiver upstream digital payload data from one or more sources and organizing said data into frames of symbols to be transmitted, each frame comprised of a plurality of timeslots each containing

symbols derived from said upstream digital payload data;

iteratively transmitting a ranging signal, and determining a transmit frame timing delay value for said ranging signal that will cause said ranging signal to arrive at a reference time in a gap in upstream transmissions during which no remote transceiver is allowed to transmit anything other than ranging signals, said transmit frame timing delay value being such that if it is imposed before transmission of each frame of upstream symbols, each frame of upstream symbols transmitted from said remote transceiver will arrive at said headend transceiver with its frame boundaries and timeslot boundaries aligned virtually exactly in time with the frame and timeslot boundaries of other frames of upstream symbols transmitted by other remote transceivers which have achieved frame synchronization.

94 ~~11~~. The process of claim ~~10~~ 93 wherein said determining step comprises the following steps:

iteratively transmitting said ranging signal prior to transmission of any payload data;

adjusting a transmit frame timing delay value before the transmission of each ranging signal until a message is received from said central transceiver that a ranging signal has been detected in a gap that exists between each upstream frame of payload data during which gap transmission of payload data by any remote transceiver is not allowed;

when said message that a ranging signal has been found in a gap is received, transmitting identification data from said remote transceiver to

said headend transceiver that identifies said remote transceiver;

receiving a message that indicates that only one remote transceiver's ranging signal has been found in the gap and giving the identification of that remote transceiver and comparing that identification to the identification of said remote transceiver that transmitted said ranging signal;

if there is a match, using data in a message indicating by how much and in which direction to adjust the transmit frame timing delay of said remote transceiver that transmitted said ranging signal to adjust said transmit frame timing delay such that said ranging signal arrives at a reference time in each gap; and

thereafter using said transmit frame timing delay to transmit upstream frames of payload data.

95 ~~12~~. The process of claim ~~10~~ 93 wherein said determining step comprises the following steps:

transmitting one or more ranging signals from a remote transceiver which can be detected by said headend transceiver in the presence of noise;

in the headend transceiver, determining the identity of the remote transceiver that transmitted the ranging signal in any way;

in said headend transceiver, calculating how far off the ranging signal transmitted by a particular remote transceiver is from a reference time in a gap in upstream transmissions during which no remote transceiver may transmit anything other than ranging signals;

sending a downstream message from said headend transceiver to the remote transceiver which transmitted said ranging signal instructing it by how much to adjust its transmit frame timing delay so as to achieve frame synchronization such that frames transmitted by said remote transceiver will arrive at said headend transceiver with their frame boundaries virtually exactly aligned in time with frame boundaries of frames transmitted by other remote transceivers that have already achieved frame synchronization;

in the remote transceiver which transmitted said ranging signal, adjusting said transmit frame timing delay per the instructions from said headend transceiver, and, thereafter, using said transmit frame timing delay for subsequent upstream frame transmissions.

96 ~~13.~~ A plurality of computer data signals encoding digital upstream data from different sources, each computer data signal embodied in a carrier wave of the same frequency and transmitted from one of a plurality of physically distributed transmitters on a shared transmission medium toward a spread spectrum receiver capable of receiving all the carrier waves and recovering the digital upstream data from each source, each computer data signal organized in numbered frames where each frame is comprised of individual elements transmitted in individual timeslots, each timeslot containing spread spectrum data representing the summation of partial products resulting from the spreading of the spectrum of digital upstream data of one or more logical channels from one or more of said different soruces, each logical channel having its spectrum spread by a different spreading code, and wherein each frame having a particular number transmitted from a transmitter has its frame and timeslot